



# CITY OF LODI COUNCIL COMMUNICATION

AGENDA TITLE: Receive Background **Information** on Implementing Woodbridge Irrigation District Surface Water Program

MEETING DATE: March **1, 2006**

PREPARED BY Public Works Director

RECOMMENDED ACTION: That the City Council receive background information on implementing the surface water treatment program utilizing the Woodbridge Irrigation District (WID) 6,000 acre-feet contractual allotment. This material is being provided in advance of the March 15, 2006 Council meeting at which staff will request preliminary approvals as described.

BACKGROUND INFORMATION: On several past occasions, the Council has received information regarding the acquisition and usage of 6,000 acre-feet per year of Mokelumne River water from Woodbridge Irrigation District. In May 2003, the City contracted with WID to provide untreated surface water to Lodi for 40 years. At the September 21, 2004 Shirtsleeve meeting, the Water Supply Options Report was presented to the Council. At the April 19, 2005 Shirtsleeve meeting, staff again presented alternatives for implementing the 6,000 acre-feet per year surface water supply. On April 20, 2005, Council approved hiring a consultant to further study and develop a recommendation for full implementation of the WID surface water supply. On June 9, 2005, Council was given a copy of the WID Surface Water Implementation Study. On November 1, 2005, Council received a presentation from the consultant and the recommendation that the City go to a conjunctive use water supply system – one that utilizes both groundwater and treated surface water to serve the demands of Lodi's customers.

Over the course of the past three years, a number of alternatives have been considered with the most feasible options being "treat and drink" and "groundwater recharge". Some of the other alternatives studied include: 1) injection well recharge, 2) raw water irrigation of parks and schools, 3) recharge ponds within the City limits, 4) recharge ponds using North San Joaquin Water Conservation District facilities, 5) East Bay Municipal Utility District banking, and 6) interim supply to Stockton recharge ponds. These alternatives were ruled out primarily due to high costs and regulatory uncertainties.

At the regional level, City of Lodi has been participating in several water supply activities that will, hopefully, bring additional water supplies to the City and the other agencies in the region. Examples include the Mokelumne River Water and Power Authority MORE Project that seeks to capture unappropriated peak flows in the Mokelumne River. Also, Lodi is collaborating with Stockton East Water District, North San Joaquin Water Conservation District and WID on a pilot-scale recharge project near Micke Grove Park. North San Joaquin Water Conservation District recently passed a groundwater recharge assessment for their groundwater recharge and is evaluating multiple sites in its district. Note that a large part of the City (generally, the area east of Mills Avenue) is within the District and pays this nominal assessment.

APPROVED: \_\_\_\_\_

Blair King, City Manager

The recently-completed 2005 Urban Water Management Plan concisely presents the City's existing and future water supply vs. demand outlook (see Exhibit A). As shown on Exhibit A, the safe long-term yield of the groundwater basin underlying the City is estimated at 15,000 acre-feet annually (afa). At present, the City is using 17,300 afa to meet the demands of existing customers, reflecting a current need for additional water supply and/or conservation.

The UWMP anticipates that through a combination of conservation (the on-going City-wide installation of water meters is expected to conserve approximately 2,400 afa upon completion) and adding 6,000 afa of WID treated surface water, the City's sustainable water supply will meet or exceed the projected water demands up to the year 2029.

The City Council will be asked to support staff's recommendation to pursue the "treat and drink" alternative on the basis it is the "**highest and best use**" of the WID water given a number of factors that are compared below.

### Cost

The estimated construction cost for a surface water treatment facility and associated facilities is estimated to be up to \$29.5 million. These costs are inclusive of site acquisition, surface water diversion piping, ultrafiltration (without pretreatment) using membrane technology, chlorine disinfection, transmission piping, and storage tanks. This alternative does eliminate the need to construct additional wells to serve future demands.

The construction cost for a groundwater recharge program is estimated to be \$30.3 million. This assumes a recharge field 88 acres in size adjacent to the WID canal at \$300,000 per acre, including site improvements and pipe appurtenances. Construction of five new wells is included in the estimate.

These costs are different from other numbers that have been discussed in the past. A comparison of former and current estimates is provided in Exhibit B.

In either scenario, new development is expected to fund the capital improvements. Operating and maintenance costs are considerably higher for the "treat and drink" alternative, when compared to the recharge option. The change to current rates would be an increase of approximately 15% (very rough estimate), if the burden was shared City-wide.

### Benefit

Criteria to evaluate benefits to the City of Lodi and the region include: 1) direct benefit to the groundwater resource, 2) long-term water quality, 3) sharing the regional burden, and 4) time of use. Each is discussed below.

#### Benefit to the Groundwater Resource

In the context that the water demands of existing Lodi are matched by the safe yield of the groundwater resource, the "treat and drink" alternative eliminates further mining of the groundwater and, thereby, results in the highest direct benefit to the groundwater basin currently serving the City.

Groundwater recharge programs have a number of inherent losses including evaporation, uptake by plant materials, and capture within the soil column. These losses can be as high as 30 percent, meaning

the process is about 70% efficient. In addition, the recharge water, once it reaches the groundwater, moves away from the Lodi point of use and toward the central/eastern-County groundwater depression. A map of the County groundwater contours is provided in Exhibit C.

#### Long-Term Water Quality

Lodi has long enjoyed a high quality of water that is pumped from the ground through wells that are clustered in relatively close proximity to the Mokelumne River. Not only has the quality of water been excellent, but the yield from each well has been relatively high, with an average yield of approximately 1,400 gallons per minute. Based upon experience and water quality information for areas southerly and westerly of the City, new wells in these areas are expected to have a higher salinity level and lower yields.

For the "treat and drink" alternative, the salinity levels in the treated surface water will be lower than levels currently found in the groundwater. Combining these two sources for potable use will result in a lowering of salinity levels in both our drinking water and our wastewater. This provides a long-term tangible benefit to the City as the State is expected to impose limits on salinity for discharges to the Delta. Lowering the salinity of our "source water" will help avoid very costly improvements to remove salinity at the wastewater end of the use cycle.

A groundwater recharge program will essentially not alter the water quality characteristics of the City's groundwater resource.

The "treat and drink" alternative will result in chlorination of the entire City water system as is required by State regulation. Most in the industry agree that chlorination requirements will also be imposed upon all groundwater users in the foreseeable future.

#### Sharing the Regional Burden

On a regional basis, the various cities and agencies are collaboratively working to enhance the supply side of the region's groundwater resource. The groundwater basin Lodi shares with other agencies and individual property owners is being mined by over 150,000 afa. This results in declining water levels in wells, which reduces yield, increases pumping costs, and impacts water quality as more saline water is drawn into the basin, rendering wells unfit for use. 150,000 afa and more is needed to meet the goal to reverse and stabilize this problem. On a conceptual level, the principal strategies to achieve this goal include: 1) securing additional surface water resources, 2) elimination or deferral of further groundwater pumping, 3) banking through recharge or deferral of pumping, and 4) regional recharge. The MORE project was described above. The Stockton Delta Water Supply Project includes a treatment plant that will begin treating 56,000 afa within three years. Lodi's water treatment plant can begin producing 6,000 afa of treated drinking water within 4.5 years. A recharge program would provide somewhat less regional benefit by virtue of the losses described above.

#### Time of Use

Water demands within the City are highest in the spring, summer and fall. Conversely, the lowest demands are in the winter. Our WID water is available from March 1 through October 15, and this perfectly matches our highest demand period. Lodi has secured high quality surface water deliveries that meld with demands, both in quantity and in time. To store such water in the ground during periods of peak demands does not make a lot of sense.

As is the strategy of many of the regional recharge programs, excess water, that usually becomes available in the winter months, is diverted to fallow fields for percolation. Often times, this water is sediment laden and well suited for groundwater recharge. The City of Lodi could pursue a similar strategy by diverting storm drainage water to recharge areas and/or by altering designs for new developments to incorporate recharge facilities.

#### Staff Recommendation

At the March 15 meeting, staff will be requesting City Council approval to move forward with the "treat and drink" alternative and that the City Council authorize staff to solicit proposals for Preliminary Water Treatment Master Planning work required to prepare preliminary design alternatives and further recommendations. Design alternatives could include partnerships with other agencies.

Among the tasks to be done are:

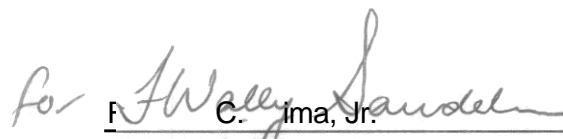
1. Watershed Assessment
2. Process Evaluation and Pilot Testing
3. Alternative Site Evaluations
4. Cost Estimates
5. Financing Alternatives
6. Environmental and Regulatory Considerations

Staff recognizes that this recommendation is not what we anticipated when the WID water purchase agreement was made. Since then, a number of factors have made groundwater recharge a less desirable alternative. Regulatory requirements on recharge projects have increased in the last few years and, most recently, water rights and underground storage permit requirements are making recharge projects more uncertain in the long-run. However, as noted earlier, recharge may be a viable alternative for the irregular peak flows associated with local storms and high river runoff events.

Due to the design complexity, regulatory requirements and cost of projects of this nature, major design decisions today are no longer made unilaterally by a project team. Instead, a consensus is reached only after participation by members of the design team and individuals outside the team, including owners, operators, regulatory agencies and the general public. Therefore, a process of measured steps, of which this is the first, is our recommendation.

**FISCAL IMPACT:** Information only. None at this time.

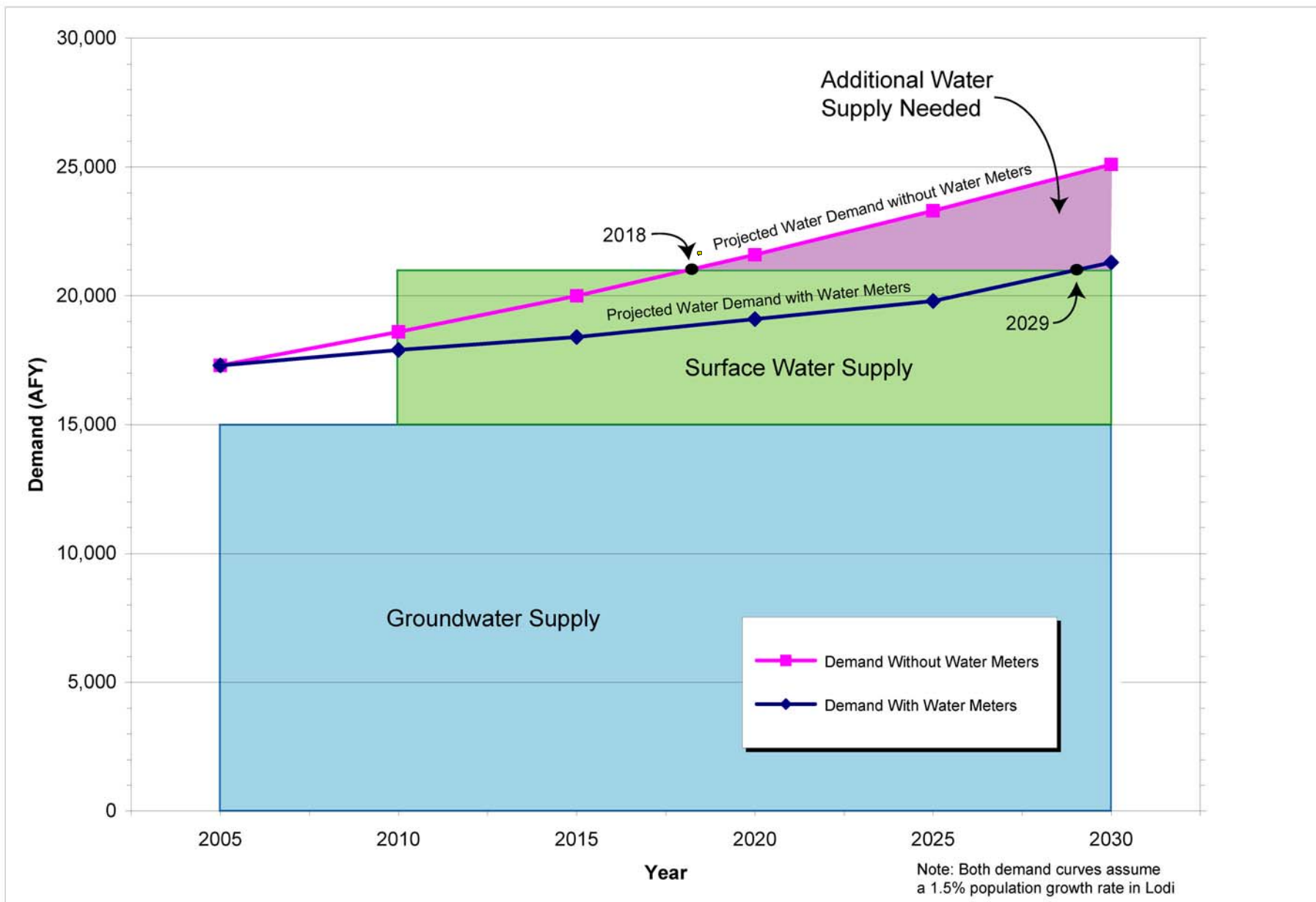
**FUNDING AVAILABLE:** Not applicable

✓   
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Richard C. Prima, Jr.  
Public Works Director

Prepared by Richard Prima, Public Works Director and F. Wally Sandelin, City Engineer

RCP/FWS/pmf

Attachments



## EXHIBIT B

### Comparison of Planning Cost Estimates

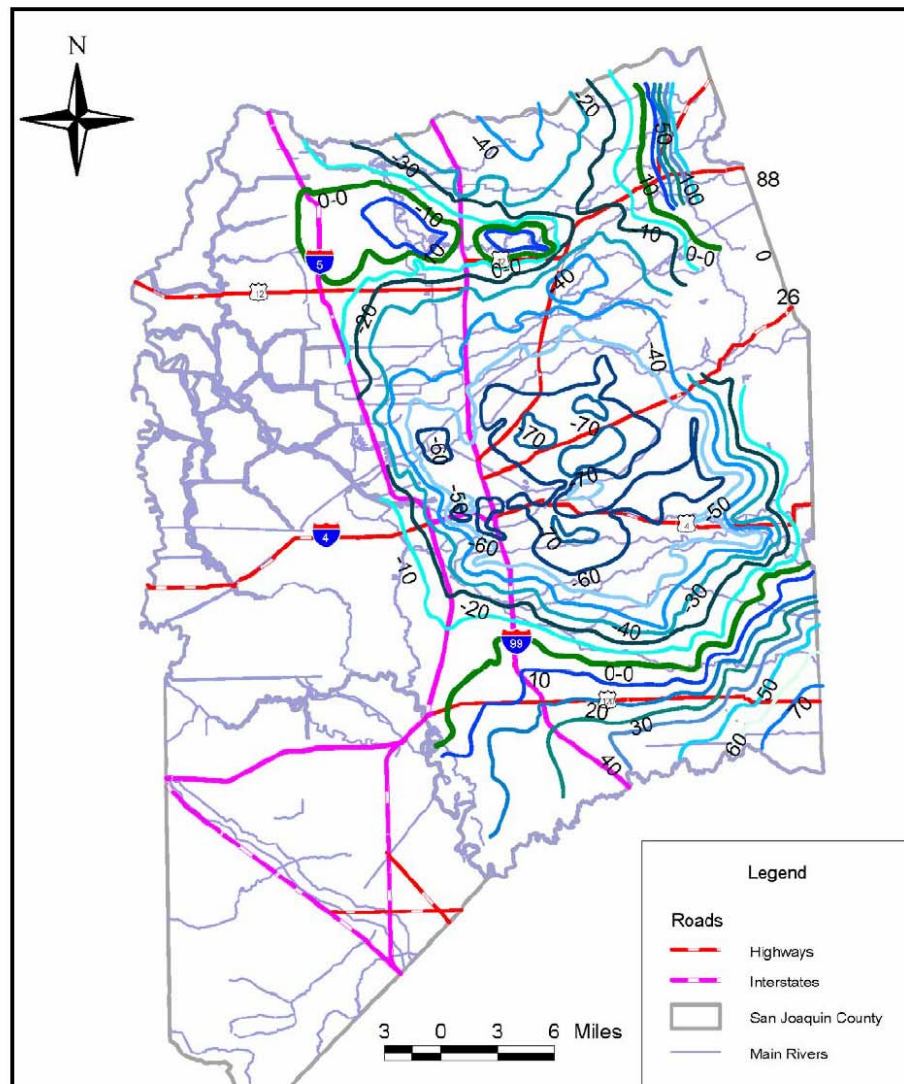
#### Recharge Basin

	2005	2006
Construction of Recharge Basin	\$593,000	\$593,000
Construction Contingency (20%)	\$119,000	\$119,000
Engineering and Other Fees (15%)	\$89,000	\$89,000
<b>Subtotal</b>	\$801,000	\$801,000
Purchase Land for Basin	\$17,600,000	\$26,400,000 <sup>(1)</sup>
CEQA/NEPA	\$100,000	\$100,000
Water Wells		\$3,000,000 <sup>(2)</sup>
<b>Total</b>	\$18,501,000	\$30,301,000

#### Surface Water Treatment Plant

	2005	2006
Surface Water Treatment Plant and Associated Transmission Facilities	\$25,700,000	\$20,000,000 <sup>(3)</sup>
Construction Contingency (20%)	\$5,100,000	\$4,000,000
Engineering and Other Fees (15%)	\$3,900,000	\$3,000,000
<b>Subtotal</b>	\$34,700,000	\$27,000,000
Purchase Land for Plant	\$1,000,000	\$1,500,000 <sup>(4)</sup>
CEQA/NEPA	\$1,000,000	\$1,000,000
<b>Total</b>	\$36,700,000 <sup>(5)</sup>	\$29,500,000

- (1) The land cost for 88 acres is assumed to be \$300,000 per acre compared to \$200,000 per acre as reflected in the West Yost Lodi Surface Water Implementation TM. (West Yost TM)
- (2) Five new wells are required for the groundwater recharge alternative and the estimated construction cost is \$600,000 per well or \$3,000,000. This cost was not included in the West Yost TM.
- (3) Further research into the type of treatment processes and after visitation to three Northern California plants, a better planning estimate has been determined to be \$20,000,000 for constructing a 10 MGD treatment plant and associated transmission facilities.
- (4) The land cost for 5 acres is assumed to be \$300,000 per acre, compared to \$200,000 per acres as reflected in the West Yost TM.
- (5) The West Yost TM presented a \$50 million number that was \$36.7 million adjusted to the forecast mid-point of construction.

*Eastern San Joaquin Groundwater Basin Groundwater Management Plan***Figure ES-2 Fall 1993 Groundwater Contours**

Source: Camp Dresser &amp; McKee Inc.